REMARKS

This is intended as a full and complete response to the Final Office Action dated May 23, 2007, having a shortened statutory period for response set to expire on August 23, 2007. Please reconsider the claims pending in the application for reasons discussed below.

Claims 1, 3-5, 7-9, 11-13, 15-21, 23, and 24 remain pending in the application and are shown above. Claims 1, 3-5, 7-9, 11-13, 15-21, 23, and 24 are rejected. Reconsideration of the rejected claims is requested for reasons presented below.

Claim Rejections – 35 U.S.C. § 103

Claims 1, 3-5, and 7-8

Claims 1, 4-5, and 7-8 are rejected under 35 U.S.C. § 103(a) as being unpatentable over *Dakshina-Murthy et al* (U.S. Patent No. 6,884,733) in view of *Godet, Journal of Applied Physics, Vol. 84, 3919 (1998)*, and *Lee et al.* (U.S. Patent No. 6,043,167). Claim 3 is rejected under 35 U.S.C. § 103(a) as being unpatentable over *Dakshina-Murthy et al* in view of *Godet, Journal of Applied Physics, Vol. 84, 3919m (1998)* and *Lee et al.*, in further view of *Yang* (U.S. Publ. No. 2003/0003771). Claim 23 is rejected under 35 U.S.C. § 103(a) as being unpatentable over *Dakshina-Murthy et al,* in view of *Godet, Journal of Applied Physics, Vol. 84, 3919*, (1998), *Lee et al.* and *Park et al* (U.S. Publ. No. 2004/0224241). Applicants respectfully traverse the rejection. Applicants believe that the claims are in condition for allowance.

The Examiner bears the initial burden of establishing a *prima facie* case of obviousness. *See* MPEP § 2142. To establish a *prima facie* case of obviousness three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine the reference teachings. Second, there must be a reasonable expectation of success. Third, the prior art reference (or references when combined) must teach or suggest all the claim limitations. *See* MPEP § 2143. The present rejection fails to establish at least the first basic criteria.

As conceded in the instant office action *Dakshina-Murthy et al.* fails to disclose the first frequency between about 10MHz-30MHz and a second frequency between about 100kHz. (*See* page 3, lines 20-23 of the instant Office Action). The instant Office Action contends that *Lee et al.* discloses a dual frequency of about 13.56 MHz for the first frequency and about 10KHz-100KHz for the second frequency. (*See* page 4, line 1 of the instant Office Action). The instant Office Action contends that it would have been obvious to one of ordinary skill in the art at the time of the invention to select dual frequency values for the RF source because *Lee et al.* illustrates that low dielectric constant films such as amorphous fluorocarbon film when deposited with a dual frequency RF source results in a stable low-k film at least up to 450°C with low internal stress. (*See* page 4, line 2-7 of the instant Office Action).

Lee et al. teaches a fluorocarbon silicon oxide composite film formed in a dual-frequency, high density plasma reactor, that is thermally stable at least to 450°C, has a dielectric constant in a range of 2 to 4, and has a low internal stress. (See US 6,043,167 at col. 2 lines 63-64; col. 3 lines 1-3). Thus *Lee et al.* teaches the advantages of thermal stability and low internal stress for a specific film – a fluorocarbon silicon oxide composite film. *Lee et al.* does not teach or suggest that the application of dual frequency provides these advantages for other low k films.

Therefore, *Dakshina-Murthy et al.* in view of *Godet*, and *Lee et al.* in further view of *Yang et al.* and *Park et al.* either alone or in combination do not teach, show, motivate, suggest, or otherwise make obvious a method for processing a substrate in a processing chamber, comprising, forming a conductive material layer on a surface of the substrate, depositing an amorphous carbon layer on the conductive material layer by a method comprising introducing into the processing chamber one or more hydrocarbon compounds having the general formula C_xH_y, wherein x has a range of 2 to 4 and y has a range of 2 to 10, and generating a plasma of the one or more hydrocarbon compounds by applying power from a dual frequency RF source, wherein the dual-frequency RF source comprises providing a first frequency between about 10 MHz and about 30 MHz and a second frequency between about 100 KHz and about 500 KHz, etching the amorphous carbon layer to form a patterned amorphous carbon layer, and etching feature definitions in the conductive material layer corresponding to

the patterned amorphous carbon layer as recited in independent claim 1, and claims 3-5, 7-8, and 23 dependent thereon.

Accordingly, the Applicants submit that claims 1, 3-5, 7-8, and 23 are in condition for allowance. Applicants respectfully request allowance of claims 1, 3-5, 7-8, and 23.

Claims 9, 11-13 and 15-18

Claims 9, 11-13 and 15-18 are rejected under 35 U.S.C. § 103(a) as being unpatentable over *Dakshina-Murthy et al* (U.S. Patent No. 6,884,733) in view of *Godet, Journal of Applied Physics, Vol. 84, 3919*, (1998) and *Lee* (U.S. Patent No. 6,043,167). Claim 16 is rejected under 35 U.S.C. § 103(a) as being unpatentable over *Dakshina-Murthy et al* in view of *Godet,* and *Lee et al.*, in further view of *Yang.* Claim 24 is rejected under 35 U.S.C. § 103(a) as being unpatentable over *Dakshina-Murthy et al,* in view of *Godet, Journal of Applied Physics, Vol. 84, 3919*, (1998), *Lee et al.* and *Park et al.* Applicants believe that claims 9, 11-13, 15-18, and 24 are in condition for allowance for the reasons discussed above for claims 1, 3-5, and 7-8.

The arguments discussed above regarding *Dakshina-Murthy et al.* in view of *Godet, and Lee et al.*, in further view of *Yang et al.* are equally applicable here because claim 9 has substantially all of the limitations of claim 1.

Therefore, *Dakshina-Murthy et al.* in view of *Godet*, and *Lee et al.,* in further view of *Yang et al.* and *Park et al.* either alone or in combination do not teach, show, motivate, or suggest a method for processing a substrate in a chamber, comprising, forming a conductive material layer on a surface of the substrate, depositing an amorphous carbon hardmask on the conductive material layer by a method comprising introducing into the processing chamber one or more hydrocarbon compounds having the general formula C_xH_y, wherein x has a range of 2 to 4 and y has a range of 2 to 10, and generating a plasma of the one or more hydrocarbon compounds by applying power from a dual-frequency RF source, wherein the dual-frequency RF source comprises providing a first frequency between about 10 MHz and about 30 MHz and a second frequency between about 100 KHz and about 500 KHz, depositing an anti-reflective coating on the amorphous carbon hardmask, depositing a patterned resist material on the anti-reflective coating and amorphous carbon hardmask to the

conductive material layer, and etching feature definitions in the conductive material layer as recited in claim 9, and claims 11-13, 15-18, and 24 dependent thereon.

Claims 19-21 and 23-24

Claims 19-21 and 23-24 are rejected under 35 U.S.C. § 103(a) as being unpatentable over *Dakshina-Murthy et al* (U.S. Patent No. 6,884,733) in view of *Godet, Journal of Applied Physics, Vol. 84, 3919*, (1998), *Lee et al.* (U.S. Patent No. 6,043,167) and *Park et al* (U.S. Publ. No. 2004/0224241). Applicants respectfully traverse the rejection. Applicants believe that claims 19-21 and 23-24 are in condition for allowance for the reasons discussed above because claim 19 has substantially all of the limitations of claim 1.

Therefore, *Dakshina-Murthy et al.* in view of *Godet*, and *Lee et al.,* in further view of *Park et al.* either alone or in combination do not teach, show, motivate, or suggest a method for processing a substrate in a chamber, comprising, forming an aluminum containing layer on a surface of the substrate, depositing an amorphous carbon hardmask on the aluminum containing layer by a method comprising introducing into the processing chamber one or more hydrocarbon compounds having the general formula C_xH_y, wherein x has a range of 2 to 4 and y has a range of 2 to 10, and generating a plasma of the one or more hydrocarbon compounds by applying power from a dual-frequency RF source, wherein the dual-frequency RF source comprises providing a first frequency between about 10 MHz and about 30 MHz at a power between 200 watts and 800 watts and a second frequency between about 100 KHz and about 500 KHz at a power between about 1 watt and about 200 watts, depositing an anti-reflective coating on the amorphous carbon hardmask, wherein the anti-reflective coating is a material selected from the group of silicon nitride, silicon carbide, carbon-doped silicon oxide, amorphous carbon, and combinations thereof, depositing a patterned resist material on the anti-reflective coating, etching the anti-reflective coating and amorphous carbon hardmask to the aluminum-containing layer, removing the resist material, etching feature definitions in the aluminum containing layer at an etch selectivity of amorphous carbon to the aluminum-containing layer at an etch selectivity of amorphous carbon to the aluminum-containing between about 1:3 and about 1:10, and removing the one or

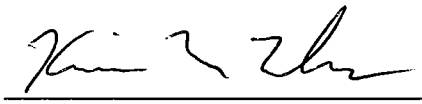
more amorphous carbon layers by exposing the one or more amorphous carbon layers to a plasma of a hydrogen-containing gas or an oxygen containing gas as recited in claim 19 and claims 20-21 dependent thereon.

Conclusion

In conclusion, the references cited by the Examiner, alone or in combination, do not teach, show, or suggest the invention as claimed.

Having addressed all issues set out in the Final Office Action, Applicants respectfully submit that the claims are in condition for allowance and respectfully request that the claims be allowed.

Respectfully submitted,



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